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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow
Department of Mechanical Engineering
Sessional Test – 1

Semester & Year: 2nd & 1st Year | **Session: 23-24**
Subject: Engineering Mechanics | **Code: TES 203**
Duration: 90 Minutes | **Max. Marks: 20**

Part A

Attempt all questions **(1×4=4 Marks)**

1. If a body weighing 200 N rests on a plane inclined at 45° to the horizontal, the component parallel to the plane is
   a) 50 N b) 86.6 N
   c) 141.4 N d) 60 N
2. In a simply supported beam of 8m span an 80 KN-m moment is acting at a distance 2m from support A. In this beam reaction at support A is
   a) 10 KN b) 16 KN
   c) 30 KN d) 75 KN
3. On a simply supported beam of span L load varies linearly from zero at end A to P at end B. Then the reaction at A is
   a) 1/3 PL b) 1/6 PL
   c) 1/3 PL^2 d) 1/6 PL^2
4. The law stating that the algebraic sum of moments of a system of coplanar forces about a moment center is equal to the moment of their resultant force about the same moment center is known as
   a) Lami's theorem b) D' Alembert's principle
   c) Varignon's theorem d) Law of transmissibility

Part B

Attempt any two Questions **(2×3=6 Marks)**

1. Determine the reactions at A, B and D of the compound beam shown in Fig.1. Neglect the self-weight of the members.

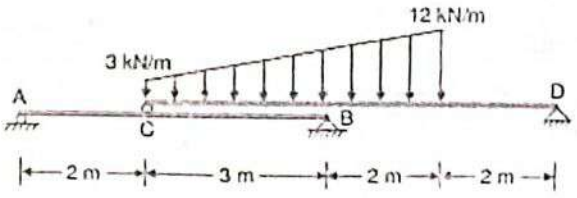

Fig.1

2. Three bars, hinged at A and D and pinned at B and C as shown in Fig. 2 form a four-linked mechanism. Determine the value of P that will prevent movement of bars.

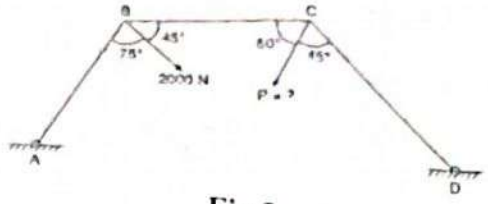

Fig.2

3. Differentiate between center of gravity and centroid. Under what conditio these will coincide? State triangle law and polygon law of forces.

Part C

Attempt any two Questions **(2×5=10 Marks)**

1. Analyse the truss shown in Fig.3.All members are 3m long.

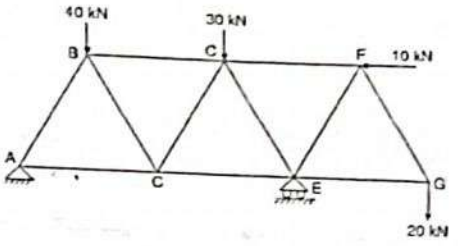

Fig.3

2. The bar shown in Fig.4 is tested in universal testing machine. It is observed that at a load of 40 KN and the total extension of the bar is 0.280 mm. Determine the Young's modulus of the material.

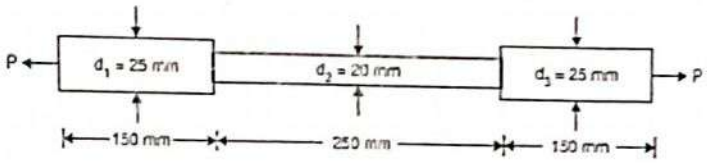

Fig.4

3. Explain the method of section and method of joint for pin connected plane frames.